AMENDMENTS TO THE CLAIMS

Please amend the claims as shown below. A complete listing of all pending claims is presented.

CLAIMS

1. (currently amended) A method of producing a semiconductor device, including:

a step of depositing ~~organic based~~organic-based interlayer insulation films (4, 6);

a step of forming an opening portion on the ~~organic based~~organic-based interlayer insulation films (4, 6); and

a step of performing silylation to reform a wall surface portion of the ~~organic based~~organic-based interlayer insulation films (4, 6) exposed in said opening portion.

2. (currently amended) The~~A~~ method of producing a semiconductor device according to claim 1, characterized by further including a step of forming protective layers (4b, 6b) including an in~~organic based~~organic-based insulation material on a surface of said opening portion wall surface subjected to silylation.

3. (currently amended) The~~A~~ method of producing a semiconductor device according to claim 2, characterized by~~that~~ the inner wall surface of said opening portion, including silylated molecules as a result of silylation, ~~is~~ being exposed to oxide plasma to form a silicon oxide film for protecting the inner wall of the opening portion in a step of forming said protective films (4b, 6b).

4. (currently amended) The~~A~~ method of producing a semiconductor device according to claim 1, characterized by further including a step of forming an ~~organic based~~organic-based substance in a state of being formed with said opening portion and removing the ~~organic based~~organic-based substance at least from said opening portion after said silylation.

5. (currently amended) The~~A~~ method of producing a semiconductor device according to claim 4, characterized by~~that~~

said opening portion comprisinges a via hole (VH) formed by penetrating two interlayer insulation films (4, 6) in a ~~dual damascene~~dual-damascene wiring process; and

a step of forming a wiring trench (CG) connected to said via hole (VH) on an upper interlayer insulation film (6) of said two interlayer insulation films (4, 6) through the steps of coating a photo resist (R) and performing exposure and development in a state of being formed with the via hole (VH) beingis further included.

6. (currently amended) The~~A~~ method of producing a semiconductor device according to claim 5, characterized by further including a step of forming an etching stopper film

(5) for protecting a via hole (VH) on a lower interlayer insulation film (4) of said two interlayer insulation films (4, 6) in advance between said two interlayer insulation films (4, 6) when etching for forming said wiring trench (CG).

7. (currently amended) The~~A~~ method of producing a semiconductor device according to claim 6, characterized by~~that~~ said etching stopper film (5) comprisinge~~s~~ a silicon nitride film.

8. (currently amended) The~~A~~ method of producing a semiconductor device according to claim 5, characterized by~~that~~ at least said upper-layer interlayer insulation film (6) formed with said wiring trench (CG) of said two interlayer insulation films (4, 6) includinge an ~~organic based~~organic-based insulation material.

9. (currently amended) The~~A~~ method of producing a semiconductor device according to claim 8, characterized by~~that~~ said ~~organic based~~organic-based insulation material beingi~~s~~ any one of a methyl group-containing SiO_2 film, a polyimide-based polymer film, a parylene-based polymer film, a Teflon (registered trademark)-based polymer film, a poly-aryl ether-based polymer film and an amorphous carbon film doped with fluorine.

10. (currently amended) The~~A~~ method of producing a semiconductor device according to claim 1, characterized by forming a porous organic insulation film as said ~~organic based~~organic-based interlayer insulation films (4, 6).

11. (currently amended) A method of producing a semiconductor device including a step of forming an opening portion on ~~organic based~~organic-based interlayer insulation films (4, 6), including:

a step of depositing ~~organic based~~organic-based interlayer insulation films (4, 6) containing a silylating agent;

a step of forming an opening portion on the ~~organic based~~organic-based interlayer insulation films (4, 6); and

a step of forming protective layers (4b, 6b) comprisinge an in~~organic based~~organic-based interlayer insulation material on an inner wall surface of said opening portion containing a silylating agent.

12. (currently amended) The~~A~~ method of producing a semiconductor device according to claim 11, characterized by~~that~~ said protective film comprisinge~~s~~ silicon oxide.

13. (currently amended) The~~A~~ method of producing a semiconductor device according to claim 11, characterized by~~that~~ a~~n~~ silicon-oxide film for protecting an inner wall surface of the opening portion beingi~~s~~ formed by exposing the inner wall surface of said opening portion containing a silylating agent to oxygen plasma in a step of forming said protective films (4b, 6b).

14. (currently amended) A semiconductor device, comprising two ~~organic based~~organic-based interlayer insulation films (4, 6) stacked on top of another, wherein a via hole (VH) is formed on a lower-layer interlayer insulation film (4) and a wiring trench (CG) connected to said via hole (VH) is formed on an upper layer interlayer insulation film (6) of the two ~~organic based~~organic-based interlayer insulation films (4, 6), and having a wiring configuration in which~~that~~ a conductive material (9, 10) is buried in the wiring trench (CG) and said via hole (VH); wherein

an inner-wall portion of said via hole (VH) of a lower-layer interlayer insulation film (4) of said two interlayer insulation films (4, 6) is provided with a silylated molecules containing layer (4a) and a protective layer (4b) and includes an in~~organic based~~organic-based insulation substance formed on a via hole (VH) inner wall surface portion of the silylated molecules containing layer (4a).

15. (currently amended) The~~A~~ semiconductor device according to claim 14, characterized by~~that~~ said protective layer (4b) comprisinges silicon oxide.

16. (currently amended) The~~A~~ semiconductor device according to claim 14, characterized by~~that~~ said opening portion comprisinges a via hole (VH) formed by penetrating two interlayer insulation films (4, 6) in a ~~dual damascene~~dual-damascene wiring process.

17. (currently amended) The~~A~~ semiconductor device according to claim 14, characterized by~~that~~ an etching stopper film (5) for protecting a via hole (VH) of a lower-layer interlayer insulation film (4) of said two interlayer insulation films (4, 6) beingis formed between said two interlayer insulation films (4, 6).

18. (currently amended) The~~A~~ semiconductor device according to claim 14, characterized by~~that~~ said etching stopper film (5) comprisinges a silicon nitride film.

19. (currently amended) The~~A~~ semiconductor device according to claim 14, characterized by~~that~~ an ~~organic based~~organic-based insulation material composing said two interlayer insulation films (4, 6) beingis any one of a methyl group-containing SiO_2 film, a polyimide-based polymer film, a parylene-based polymer film, a Teflon (registered trademark)-based polymer film, a poly-aryl-ether-based polymer film and an amorphous carbon film doped with fluorine.

20. (currently amended) The~~A~~ semiconductor device according to claim 14, characterized by~~that~~ said two ~~organic based~~organic-based interlayer insulation films (4, 6) comprisinge a porous organic insulation film.